		Genera.	*Species.*	
Batrachia	Urodela	6	15	120
	Gymnophiona	4	7	
	Anura	31	98	
Reptilia	Crocodilia	2	3	489
	Testudinata	11	28	
	Lacertilia	42	184	
	Ophidia	92	274	

Mammals.—Dr. A. Günther (*Ann. and Mag. Nat. Hist.*, Dec., 1884), describes *Alcelaphus cokii*, a hartebeest, killed by Col. Coke, on the east coast of Africa, and *Gazella thomsoni*, from frontlets brought home by Mr. J. Thomson, from his recent trip to Mt. Kenia and Victoria Nyanza. Mr. Thomson also brought back a frontlet of *A. cokii*. Thomson's gazelle is marked with a distinct black lateral band, which is absent in the allied *G. grantii*, with which it does not mingle.——Mr. Caldwell writes that Platypus embryos are quite easy to get and he cannot understand why they were not obtained before. He has thirty blacks with him and they have found 500 Echidna in six weeks.——From a study of the cerebral convolutions of the Carnivora and Pinnepedia, Professor St. Geo. Mivart gives additional reasons for the threefold division of the forms into Cynoidea, Æluroidea and Arctoidea. In a paper recently read before the Linnean Society, he called attention to the universal tendency among the Arctoidea to the definition of a distinct and conspicuous lozenge-shaped patch of brain substance defined by the crucial and pre-crucial sulci. This condition does not occur in any non-Arctoid carnivore, but is found in *Otaria gillespii* and *Phoca vitulina*, where it is small and much hidden. He adduced this fact as an important argument in favor of the view that the Pinnipedia were evolved from some Arctoid, probably Ursine, form of land carnivore. The brains of Naudinia, Galidia, Crytoprocta, Bassaricyon, Mellivora, Galictis and Grisonia, were for the first time described in detail. The Viverrina, judged by the cerebral characters, formed a very distinct group among the Æluroids.

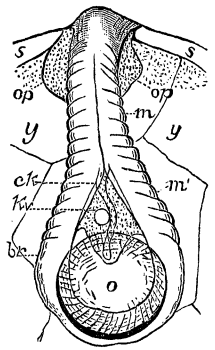
EMBRYOLOGY.[1]

On the Formation of the Embryonic Axis of the Teleostean Embryo by the Concrescence of the Rim of the Blastoderm.—During the season of 1881, I had an opportunity to study part of the developmental history of *Elacate canadus* at Cherrystone, Virginia. But unfortunately the lot of ova investigated by me did not develop to the period of hatching, but only passed a little beyond the stage when the blastoderm closes. As I have referred elsewhere to the very remarkable condition of affairs observed by me just previous to the closure of the blastoderm in this species, and not being likely to soon again have an opportunity to study the same form, I will now describe and figure what

[1] Edited by John A. Ryder, Smithsonian Institution, Washington, D. C.

was then observed in a number of ova, from which I infer that the peculiarity about to be described is charactistic of the development of this form. This species hatches in 24 to 36 hours.

The accompanying figure represents the embryo lying on the surface of the vitellus, and is represented as foreshortened, anteriorly the optic lobes, *op op*, on the other side of the vitellus show through the transparent yolk. The embryonic axis shows the segments or somites, *m*, distinctly developed, but it is very remarkable that the segmentation does not end at the point where the axis of the embryo so far formed ends. The right and left limbs of the blastodermic rim form a Λ-shaped mass, together with the embryonic axis anteriorly, but unlike any other normal teleostean embryo both these limbs of the rim are distinctly segmented for some distance as at *m'*.



Just within the yolk and a little in front of the yolk-blastopore, which runs forward into the acute angle formed by the limbs of the blastodermic rim, *br*, lies the large oil drop, *o*. A lozenge-shaped mass of cells lies in the acute angle of the Λ-shaped terminal part of the embryo, which appears to contain or overlie Kupffer's vesicle, *Kv*, and what was assumed to be the chorda, *ck*, at the time the observation was made, but of the certainty of this determination I am not at present satisfied. I was enabled to sketch this and a slightly more advanced stage several times, and as already stated found the same condition in a number of embryos, which seemed to be developing normally. Four other sketches show that the blastoderm finally closes very much as in other teleostean embryos and that pronounced wrinkles radiate from the crater-like opening upon the yolk where the yolk-blastopore finally disappears.

The conclusions of His and Rauber to the effect that the embryonic axis is formed by the gradual fusion from before backwards of the inner edges or the lips of the yolk-blastopore, as it advances over the surface of the vitelline globe, are in this case evidently correct, though it must be admitted that the presence of the cellular mass between the limbs of the blastodermic rim where they join the embryonic axis is not a little puzzling.—*John A. Ryder.*

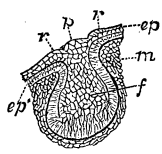
THE MODE OF FORMATION AND THE MORPHOLOGICAL VALUE OF THE EGG OF NEPA AND NOTONECTA.—In the last number of the *Zeitschr. für wissenschaftl. Zoölogie*, 1885, XLI. (p. 311), Ludwig Will has an article on this subject and reaches the rather startling conclusion that an egg-cell is not necessarily a simple protoplast, but may, while on the way towards the development of the ripe

egg, give rise to other cells. In fact, the central chromatin body of the primitive egg-cell, which he calls the *oöblast*, ejects a large number of chromatin pellets from its substance which become the nuclei of the cells forming the egg-follicle. The conclusion at which Will arrives after reviewing the work of Fol, Roule, Sabatier, H. Ludwig, Balbiani and others, that in the ascidians, myriapods and insects, the nuclei of the follicular epithelium owe their origin to the primitive germinal nucleus or the oöblast, also holds good in respect to the ova of birds and amphibians, is of great interest, and stands in sharp contrast to the old view that, the ovi-cell and epithelial cells of the follicle were both originally similar elements (germ-cells), but which have merely developed farther in widely differents ways.

Will summarizes his results as follows: 1. The nuclei of the follicular epithelium are formed from the oöblast. 2. The residuum of the oöblast becomes the germinative vesicle of the egg. 3. Ova which are without a follicular epithelial investment, as is the case in numerous groups of animals, are homologous only with the egg plus the follicular epithelium of the higher forms. 4. The egg of the Hemiptera is neither a cell nor an assemblage of cells, but the *product* of several cells. 5. The homological value of the eggs of different types is to be found in the fact that, in every case the ripe egg represents a germinal mass, in which are contained all the capabilities of future development, and which is the *product* of the activities of those cells which have shared in its construction.

On the Development of the Mammary Glands of Cetacea.—The following is an abstract of an account of some researches just completed for publication upon this subject, founded upon materials in the U. S. National Museum.

In cutting longitudinal sections of the tail of a female embryo of *Globiocephalus melas*, two inches long, the microtome cut through the incipient mammary glands, one of which lies on either side of the external genital opening. The direction of the plane of section is nearly vertical and transverse judging from the appearance of the consecutive series. The accompanying cut will give the reader some idea of the appearance of these organs at the time they begin to be involuted or formed as thickenings of the epidermis of the young fœtus of these huge mammalia.



The outer corneous layer of the epidermis or epiblast, *ep*, and the lower layer of the latter on the Malpighian stratum, *ep'*, are alone concerned in the formation of the first rudiments of the mammæ, as in other mammalia. Although but a single stage was investigated, and not being aware of the existence of any previously published researches upon this subject, it has been thought best

to give my results together with such other information as could be gathered from the examination externally of the mammæ of a female whale's fœtus, five and a-half inches long, belonging to the Pacific genus Rhachianectes. The stage here figured displays the gland in the undifferentiated condition of the five-months' human embryo, when the gland consists merely of an involution of the malpighian layer, *ep'*, filled by a solid core of more rounded cells, *f*, which seem to become blended, at the lower end of the involution, with the Malpighian layer, the whole structure presenting the appearance of a solid pyriform body jutting down into the mesoblast, *m*, and connected with the epidermis externally by a narrow pedicel.

No signs of the outgrowth of the rudiments of acini from this pyriform body have yet appeared, but it would be inferred from the shape of the gland in the adults that these acini would be most apt to first appear at the anterior and posterior sides of this body. The gland in the adult cetaceans is greatly elongated, flat and less than one-third as wide as long, reaching the enormous dimensions of ten feet in length, three feet in width and eight inches in thickness in the adult, gravid female of *Balaenoptera sibbaldii*. In the adult the gland is also traversed longitudinally by a spacious lacteal sinus, which is probably developed during the growth of the gland by a process of vacuolization. This sinus opens externally through the nipple by way of a single duct. The gland therefore probably belongs to that subdivision of mammary organs provided with pseudo-nipples, which are developed by the production of the edge of the embryonic mammary area into a tubular teat traversed by a single canal as in the cow, certain marsupials and rodents.

In combination with the peculiar internal structure of the mammary gland of cetaceans, there is also an external teleological modification of a remarkable character, the nipple itself being lodged in a cleft or fossa, and concealed from view from without by a pair of longitudinal folds which close over it. From the evidence presented by my sections of the stage here figured of the development of the mammæ of Globiocephalus, when compared with the condition of these organs in the relatively older female embryo of Rhachianectes, already mentioned, it would seem probable that these folds were developed very early, as the nipple-rudiment or mammary area, *p*, has a fold on either side of it, represented in the figure by the elevations, *r r*, because in the larger embryo of Rhachiancetes the mammary fossæ are already developed, and there are no externally visible indications of nipples under or between the folds, the cleft being still very short in this specimen, or only about 0.5 millimeter, being absolutely minute as compared with the mammary fossæ of the adult, in which they must be over a foot in length.

It thus becomes evident that the mammary glands of cetaceans

develop at the start in much the same way as those of other Mammalia, but that their evolution is complicated somewhat by the early appearance of the folds on either side of the mammary area, which grow upward to form the sides and roof of the fossæ, which eventually enclose the nipples. The condition of the still earlier stages of the gland, judging from the general appearance of my sections, must be very similar to that observed in other mammals by Huss, Langer, Kölliker and others.—*John A. Ryder.*

PHYSIOLOGY.[1]

BACTERIA LITERATURE.—Bacteria, by G. M. Sternberg, M.D. Wm. Wood & Co., N. Y., 1885; Micro-organisms and Disease by E. Klein, M.D., F.R.S., Macmillan & Co., 1884. English-reading students are to be congratulated that two such competent workers as are the authors of these books have not only given accounts of our knowledge concerning bacteria, but have described in sufficient detail their experimental methods so that the laboratory student has but to follow directions in order to enter the field of bacteria research.

Dr. Sternberg's work includes a translation of Megnin's Bacteria, in which are described the morphology, classification and physiology of the germ fungi. But the laboratory student will find particularly valuable the translator's original chapters on technology, germicides and antiseptics, bacteria in infectious diseases and bacteria in surgical lesions. Photo-micrographs form in part the illustrations of the book. To a worker the bibliography alone is more than worth the price of the book.

Photo-micrographs and how to make them, by the same author, is an elaborate and practical aid in this special branch of technology.

The work of Dr. Klein is a reprint of a series of articles which appeared first in the *Practitioner*. In addition to a clear account of methods of research the author gives a copiously illustrated description of the forms of bacteria and a consideration of their relation to disease. Especially valuable are the criticisms on such views as Buchner's concerning the transmutability of pathogenic and non-pathogenic forms.

VASO-MOTOR NERVES.—Recherches Experimentales sur le Système Nerveux Vaso-moteur, Paris, Masson, 1884, pp. 338. Under this title MM. Dastre and Morat collect and publish with considerable diffuseness the results of observations on the functions of the vaso-motor nerves already announced by them during the last five years.

This work does not strike the reader as a very keen criticism of disputed points in this difficult subject, nor is any considerable experimental ingenuity manifested. The method of exposition,

[1] This department is edited by Professor HENRY SEWALL, of Ann Arbor, Mich.